

Appn. No. 09/700,879
Amd. dated October 15, 2003
Reply to Office Action of July 15, 2003

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 (Previously presented). A conjugate of (1) at least one therapeutic agent for joint diseases and (2) hyaluronic acid, a hyaluronic acid derivative or a salt thereof, wherein said at least one therapeutic agent for joint diseases covalently binds to the hyaluronic acid, the hyaluronic acid derivative or the salt thereof via a spacer.

Claim 2 (Cancelled).

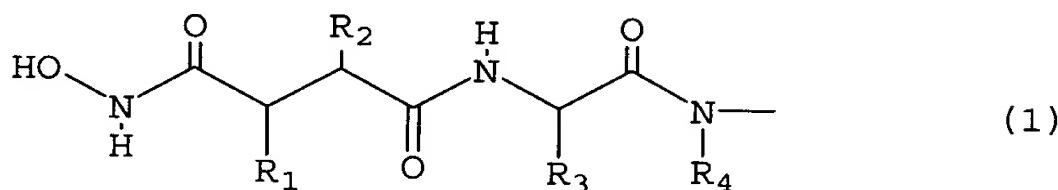
3 (Previously presented). The conjugate of claim 1, wherein the therapeutic agent for joint diseases is a matrix metalloprotease inhibitor.

Claim 4 (Cancelled).

5 (Previously presented). The conjugate of claim 3, wherein the weight ratio of the matrix metalloprotease inhibitor to the entire conjugate is 0.01 to 50%.

6 (Previously presented). The conjugate of claim 3, wherein the matrix metalloprotease inhibitor is a hydroxamic acid residue.

7 (Previously presented). The conjugate of claim 3,
wherein the matrix metalloprotease inhibitor is a hydroxamic acid
residue represented by the general formula (1):



wherein

R₁ is a hydrogen atom, a hydroxyl group or a straight-chain or branched-chain alkyl group having 1 to 8 carbon atoms;

R₂ is a straight-chain or branched-chain alkyl group having 1 to 8 carbon atoms;

R₃ is a straight chain or branched alkyl group having 1 to 8 carbon atoms which may be substituted with a cycloalkyl group, an aryl group or a heterocyclic group; and

R₄ is a hydrogen atom or an alkyl group having 1 to 4 carbon atoms.

8 (Previously presented). The conjugate of claim 1,
wherein the spacer is represented by the general formula (2):



wherein

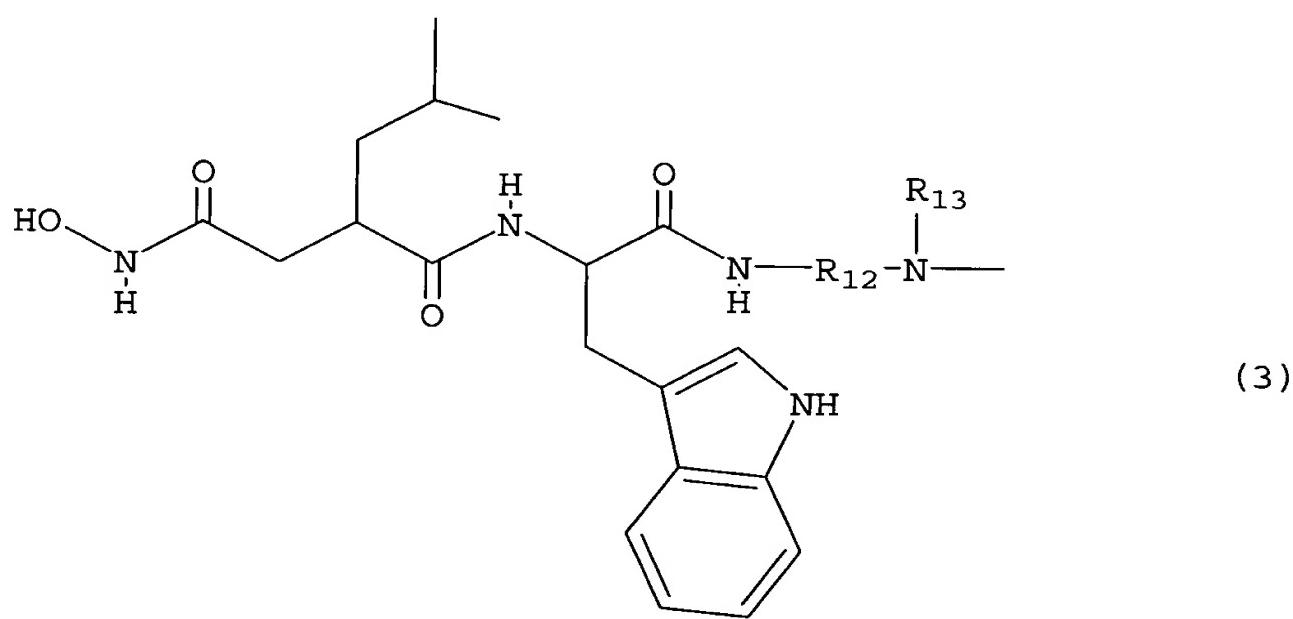
R₅ is a straight-chain or branched-chain alkylene group having 1 to 8 carbon atoms;

R_6 is an oxygen atom or a methylene or imino group which may be substituted with a straight-chain or branched-chain alkyl group having 1 to 4 carbon atoms;

R₇ is a straight-chain or branched-chain alkylene group having 1 to 10 carbon atoms into which one to three oxygen atoms may be inserted; and

R_8 is an oxygen atom, a sulfur atom or NR_9 , wherein R_9 is a hydrogen atom or a straight-chain or branched-chain alkyl group having 1 to 4 carbon atoms.

9 (Currently amended). The conjugate of claim [[1]] 3,
wherein the matrix metalloprotease inhibitor and the spacer
constitute a moiety represented by the general formula (3):



wherein

R_{12} is a straight-chain or branched-chain alkylene group having 2 to 23 carbon atoms into which one imino group and/or one to four oxygen atoms may be inserted; and

R₁₃ is a hydrogen atom or a straight-chain or branched-chain alkyl group having 1 to 4 carbon atoms.

10 (Previously presented). The conjugate of claim 3, wherein the matrix metalloprotease inhibitor in the form of a conjugate with hyaluronic acid, a hyaluronic acid derivative or a salt thereof inhibits a matrix metalloprotease *in situ*.

11 (Previously presented). A method for preparing the conjugate of claim 1 comprising binding a site of the therapeutic agent for joint diseases that does not affect the activity of the agent to a carboxyl group, a hydroxyl group or a functional group at the reducing end of hyaluronic acid, a hyaluronic acid derivative or a salt thereof by direct chemical reaction or via a spacer.

12 (Previously presented). A pharmaceutical composition comprising the conjugate of any one of claims 1, 3, 5-10, 18-21, 23 and 24 and a pharmaceutically acceptable diluent.

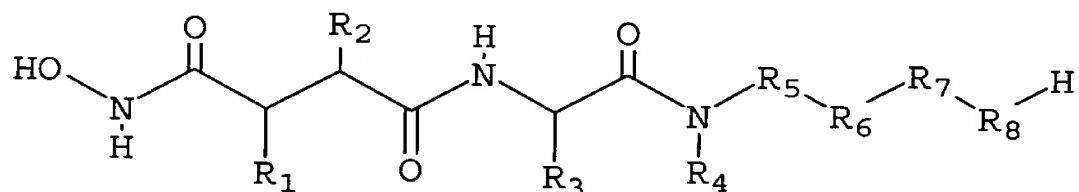
Claims 13-16 (Cancelled).

17 (Previously presented). A method for treating a patient having a joint disease comprising administering a pharmaceutical composition containing a pharmaceutically effective amount of the conjugate of any one of claims 1, 3, 5-10, 18-21, 23 and 24 as the effective ingredient to the patient.

18 (Previously presented). The conjugate of claim 1, wherein the therapeutic agent for joint diseases is selected from the group consisting of a cyclooxygenase 2 inhibitor, an antirheumatic agent and a matrix metalloprotease inhibitor.

19 (Previously presented). The conjugate of claim 1, wherein the bond between at least one therapeutic agent for joint diseases and hyaluronic acid, a hyaluronic acid derivative or a salt thereof is selected from the group consisting of an amide bond, an ether bond and a sulfide bond.

20 (Previously presented). A conjugate obtained by reacting a compound represented by the following general formula:



wherein

R₁ is a hydrogen atom, a hydroxyl group or a straight-chain or branched-chain alkyl group having 1 to 8 carbon atoms;

R₂ is a straight-chain or branched-chain alkyl group having 1 to 8 carbon atoms;

R₃ is a straight chain or branched alkyl group having 1 to 8 carbon atoms which may be substituted with a cycloalkyl group, an aryl group or a heterocyclic group;

R₄ is a hydrogen atom or an alkyl group having 1 to 4 carbon atoms;

R₅ is a straight-chain or branched-chain alkylene group having 1 to 8 carbon atoms;

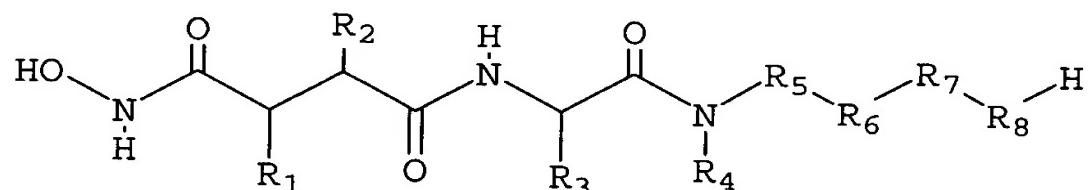
R₆ is an oxygen atom or a methylene or imino group which may be substituted with a straight-chain or branched-chain alkyl group having 1 to 4 carbon atoms;

R₇ is a straight-chain or branched-chain alkylene group having 1 to 10 carbon atoms into which one to three oxygen atoms may be inserted; and

R₈ is an oxygen atom, a sulfur atom or NR₉, wherein R₉ is a hydrogen atom or a straight-chain or branched-chain alkyl group having 1 to 4 carbon atoms;

with hyaluronic acid, a hyaluronic acid derivative or a salt thereof and a dehydrative condensation agent.

21 (Previously presented). A conjugate according to claim 20 obtained by reacting a compound represented by the following general formula:



wherein

R₁ is a hydrogen atom, a hydroxyl group or a straight-chain or branched-chain alkyl group having 1 to 8 carbon atoms;

R₂ is a straight-chain or branched-chain alkyl group having 1 to 8 carbon atoms;

R₃ is a straight chain or branched alkyl group having 1 to 8 carbon atoms which may be substituted with a cycloalkyl group, an aryl group or a heterocyclic group;

R₄ is a hydrogen atom or an alkyl group having 1 to 4 carbon atoms;

R₅ is a straight-chain or branched-chain alkylene group having 1 to 8 carbon atoms;

R₆ is an oxygen atom or a methylene or imino group which may be substituted with a straight-chain or branched-chain alkyl group having 1 to 4 carbon atoms;

R₇ is a straight-chain or branched-chain alkylene group having 1 to 10 carbon atoms into which one to three oxygen atoms may be inserted; and

R₈ is an oxygen atom, a sulfur atom or NR₉, wherein R₉ is a hydrogen atom or a straight-chain or branched-chain alkyl group having 1 to 4 carbon atoms;

with hyaluronic acid, a hyaluronic acid derivative or a salt thereof, a dehydrative condensation agent and a reaction accelerating additive.

22(Previously presented). A method of treating a joint disease in a patient in need thereof, comprising administering a pharmaceutical composition to said patient in an amount sufficient for said treatment, wherein said pharmaceutical composition comprises a conjugate in accordance with claim 1.

23 (Previously presented). The conjugate of claim 1, wherein component (1) is a single therapeutic agent for joint disease.

24 (Previously presented). The conjugate of claim 1, wherein component (2) is hyaluronic acid or a salt thereof.

25 (New). The method of claim 17, wherein the joint disease is selected from the group consisting of osteoarthritis, rheumatoid arthritis, and scapulohumeral periarthritis.